

**THE DISTINCTION BETWEEN *DASINEURA* SPP. (DIPTERA:
CECIDOMYIIDAE) FROM APPLE AND PEAR**

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Abstract.—Two species of gall midges, *Dasineura pyri* (Bouché) and *Dasineura mali* (Kieffer), are responsible for a similar leaf roll on pear and apple, respectively. These two species are found to have distinct differences in their male genitalia, effectively distinguishing these taxa morphologically. This evidence supports biological evidence that the two species are distinct and allows for ease of discrimination for voucher purposes.

Key Words: New Zealand, male genitalia, identification

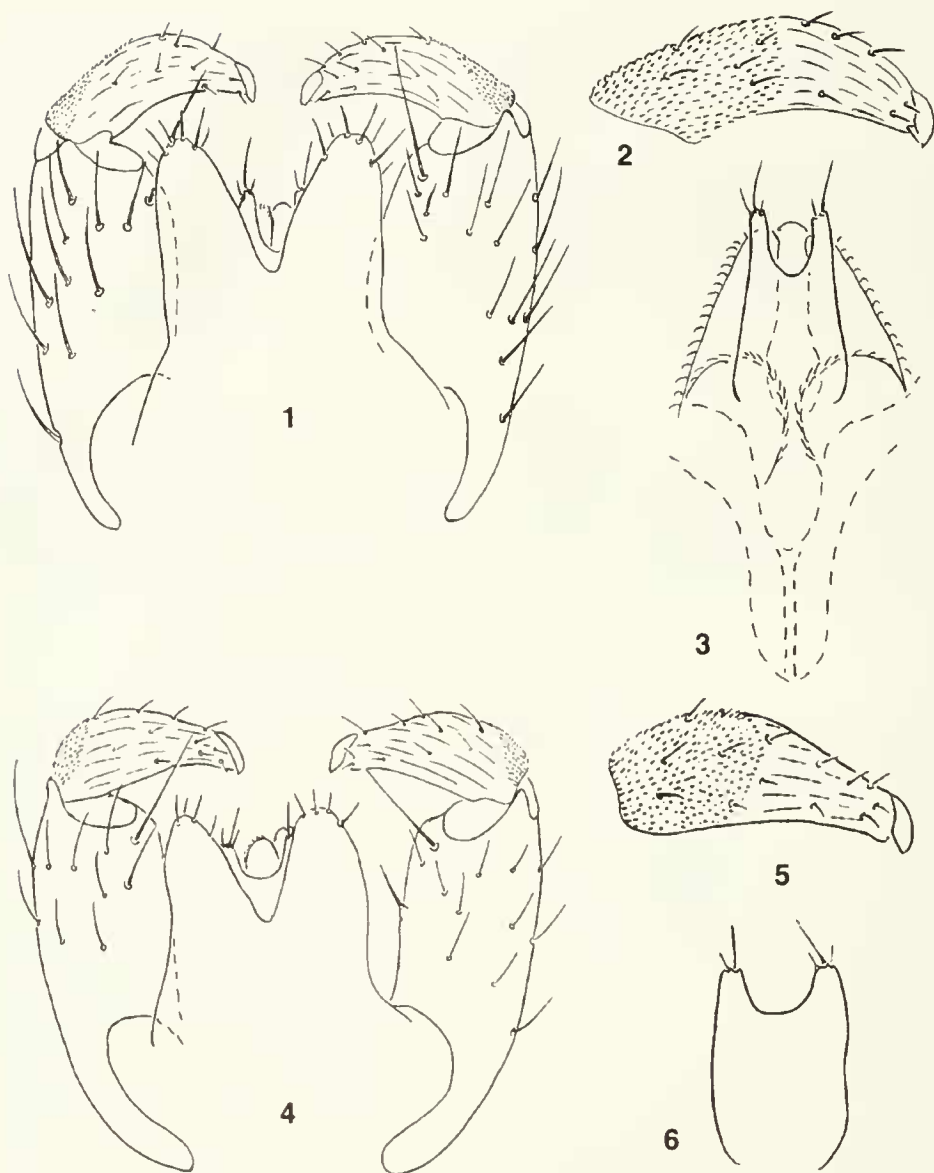
Dasineura pyri (Bouché) and *Dasineura mali* (Kieffer) were described from similar damage on pear and apple, respectively. Both species exhibit similar habits (Barnes 1948, Sylvén 1975). Females lay eggs on new leaves and the larvae hatch shortly after and begin feeding, causing the leaves to roll around them. Fully fed third instars usually drop to the soil to pupate, after which the rolled leaves die. Both species may have several generations per year.

Bouché (1847) originally described the larva, pupa, and both sexes of *D. pyri*. This species is known throughout Europe, where it is evidently native, and was accidentally introduced with stock into North America and New Zealand (Barnes 1948). Kieffer (1904) described the larva, male, and female of *D. mali* but did not point out any differences between his new species and *D. pyri*. *Dasineura mali* has been reported throughout Eurasia, and it has also been accidentally introduced with stock into North America and New Zealand (Barnes 1948).

No practical method to separate these two species has ever been published, al-

though several observations indicate they are distinct. Barnes (1948) tried unsuccessfully to breed each on the other's host. Harris et al. (1996) found that male gall midges from apple did not respond to female gall midges from pear in wind tunnel assays. Both species were included in many-species studies of Oligotrophini, the tribe to which these two species belong. Differences between small samples of *D. pyri* and *D. mali* were reported for: the length of certain larval setae as compared to larval length (Sylvén 1975); the length of the R5 vein in relation to wing length and length of the ovipositor relative to wing length (Sylvén and Carlbäcker 1981); and morphometrics of the antennae (Sylvén and Carlbäcker 1983).

In New Zealand leafcurling gall midges are pests in both apple and pear orchards. The development of management systems for these pests would be aided by knowing definitely whether only one pest or two separate pests need to be managed. A study was made to determine whether these species showed any differences that could be used to separate them with confidence.



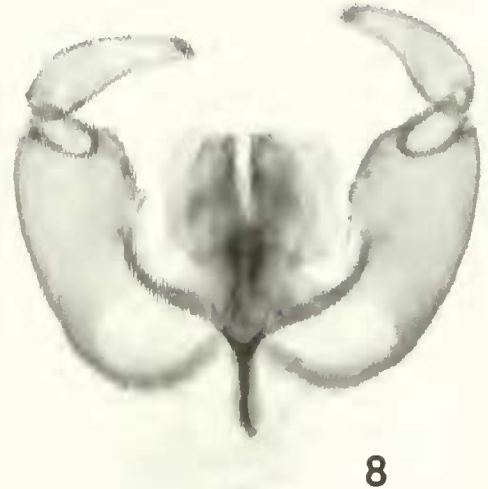
Figs. 1-6. 1-3, Male genitalia of *Dasineura pyri* (from New Zealand). 1, Dorsal view. 2, Gonostylus (ventral). 3, Hypoproct and, behind, the aedeagus, parameres, and aedeagal apodeme. 4-6, Male genitalia of *D. mali* (from New Zealand). 4, Dorsal view. 5, Gonostylus (ventral). 6, Hypoproct (ventral).

Mature larvae were collected from typical damage on apple and pear trees in Hawkes Bay, New Zealand. Adults were reared from them and the pupal exuviae were also saved. All stages were temporarily preserved in 70% alcohol. Examples from the various stages were permanently mounted

in Canada balsam on slides using the method outlined in Gagné (1989, 1994). The mounted specimens from the two hosts were viewed by one of us (RJG) without looking at the labels to see whether two different entities could be detected from differences in characters usually used for spe-



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Figs. 7, 8. 7, Male genitalia of *Dasineura pyri* (from New Zealand). 8, Male genitalia of *D. mali* (from New Zealand).

cies discrimination. These characters included, e.g. the shape of the larval spatula, the shape of the pupal head, the number and shape of adult antennal flagellomeres, and the shape of the genitalia. Larvae, pupae, and females appeared to be similar, and larvae and females were not distinguishable with characters used in Sylvén (1975) and Sylvén and Carlbäcker (1981, 1983). Slide-mounted males, however, readily fell into two groups on the basis of the shape of their gonostyli (Figs. 1, 2, 4–8). The specimens in one of these groups all came from apple, those of the other group all from pear.

A further test was made comparing the males from New Zealand together with other males from apple and pear already in the USNM collection, again without looking at the labels. These other male specimens came from pear from Canada (New Brunswick; $n = 5$), UK (England; $n = 8$), and USA (Washington; $n = 2$) and from apple from Austria ($n = 6$), Canada (New Brunswick; $n = 2$), and USA (Massachusetts; $n = 3$). These specimens again fell into two groups corresponding to whether they came from pear or apple.

The gonostyli of *D. pyri* (Figs. 1, 2) are

longer than those of *D. mali* (Figs. 4, 5) and evenly tapered. Those of *D. mali* are more bulbous at their bases. The hypoproct is slightly more deeply divided in *D. pyri* (Fig. 3) than in *D. mali* (Fig. 6) in the New Zealand specimens, but that difference is not evident in specimens from elsewhere, so is evidently subject to variation. *Dasineura pyri* and *D. mali* are thus distinguishable and are demonstrably distinct species.

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